

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-6 (canceled)

7. (currently amended) An isolated polynucleotide encoding a τ subunit of a *Thermus thermophilus* DNA polymerase III-type enzyme of a thermophilic bacterium, the τ subunit comprising a GXXGXGKT ATP-binding motif and possessing ATP binding capability, wherein ~~said τ subunit has a molecular weight of about 58,000 daltons as determined by SDS-PAGE under non-reducing conditions~~ said isolated polynucleotide hybridizes to the complement of SEQ ID NO: 3 under hybridization and wash conditions comprising 5X SSC at 65°C.

8. (currently amended) An isolated polynucleotide according to Claim 7, wherein the polynucleotide comprises a nucleotide sequence encoding said amino acid residue sequence of ~~is represented by the formula shown in SEQ ID NO:2, analogs thereof, muteins thereof, alleles thereof, and active fragments thereof.~~

9. (currently amended) An isolated polynucleotide according to Claim 7, wherein the polynucleotide sequence is the polynucleotide sequence of positions 132 to 1713 of SEQ ID NO:1, ~~conserved variants thereof, analogs thereof, active fragments thereof, and combinations thereof.~~

10. (currently amended) An isolated polynucleotide according to Claim 7, wherein the polynucleotide is the polynucleotide sequence of positions 1 to 2027 of SEQ ID NO:1, ~~conserved variants thereof, analogs thereof, active fragments thereof, and combinations thereof.~~

11-21 (canceled)

22. (currently amended) A vector comprising ~~an isolated nucleic acid molecule taken from Claim 11~~ a polynucleotide according to claim 7.

23-26 (canceled)

27. (original) A vector selected from pETdnaX and pETdnaN.

28. (currently amended) A host cell comprising ~~at least one of the vectors~~ of the vector according to Claim 22.

29. (original) The host cell according to Claim 28, wherein the host cell is a prokaryotic cell.

30-37 (canceled)

38. (withdrawn) An isolated DNA which codes for a recombinant DNA polymerase III-type enzyme, or subunit thereof, from a thermophilic bacterium, consisting essentially of a DNA fragment which hybridizes in a Southern blot to an isolated DNA fragment selected from the group consisting of the DNA fragments defined in SEQ ID NO:6 and the DNA fragments defined in SEQ ID NO:8, wherein hybridization is conducted under the following conditions:

a) hybridization: 1% crystalline BSA (fraction V) (Sigma), 1 mM EDTA, 0.5 M NaHPO₄ (pH 7.2), 7% SDS at 65°C for 12 hours and;

b) wash: 5 x 20 minutes with wash buffer consisting of 0.5% BSA, fraction V), 1mM Na₂EDTA, 40 mM NaHPO₄ (pH 7.2), and 5% SDS.

39. (withdrawn) A cloning vector comprising the isolated DNA of Claim 38.

40. (withdrawn) A host cell transformed by the vector of Claim 39.

41. (withdrawn) A method for producing a recombinant thermostable DNA polymerase III-type enzyme, or subunit ~~thereof~~ thereof, from a thermophilic bacterium comprising culturing a host cell transformed with the vector of Claim 39 under conditions suitable for the expression of said DNA polymerase III-type enzyme or said subunit.

42-43 (canceled)

44. (currently amended) An isolated DNA molecule encoding a protein subunit of DNA polymerase III-type enzyme from a ~~thermophilic bacterium~~ *Thermus thermophilus* wherein the subunit group is selected from the group consisting of τ , γ at a -1 frameshift, γ at a -2 frameshift, ϵ , α , and β .

45. (currently amended) The isolated DNA molecule according to Claim 44, wherein ~~44~~, wherein the subunit is τ and has a molecular weight of 58 kD.

46. (original) The isolated DNA molecule according to Claim 45, wherein the protein has an amino acid sequence corresponding to SEQ ID NO:2.

47. (original) The isolated DNA molecule according to Claim 45, wherein the DNA molecule has a nucleotide sequence corresponding to SEQ ID NO:3.

48. (withdrawn) The isolated DNA molecule according to Claim 44, wherein the subunit is γ at a -1 frameshift, and has a molecular weight of 50.8 kD.

49. (withdrawn) The isolated DNA molecule according to Claim ~~48~~ 46, wherein the protein has an amino acid sequence corresponding to SEQ ID NO:4.

50. (withdrawn) The isolated DNA molecule according to Claim 44, wherein the subunit is γ at a -2 frameshift, and has a molecular weight of 49.8 kD.

51. (withdrawn) The isolated DNA molecule according to Claim ~~50~~ 47, wherein the protein has an amino acid sequence corresponding to SEQ ID NO:5.

52. (currently amended) An expression system comprising an isolated nucleic acid molecule according to Claim ~~44~~ 44.

53. (original) The expression system according to Claim 52, wherein the protein corresponds to τ and has an amino acid sequence corresponding to SEQ ID NO:2.

54. (original) The expression system according to Claim 53, wherein the DNA molecule has a nucleotide sequence corresponding to SEQ ID NO:3.

55. (withdrawn) The expression system according to Claim 52, wherein the protein corresponds to the ε subunit and has an amino acid sequence corresponding to SEQ ID NO:95.

56. (withdrawn) The expression system according to Claim 55, wherein said subunit has a nucleotide sequence corresponding to SEQ ID NO:94.

57. (withdrawn) The expression system according to Claim 52, wherein the protein corresponds to the α subunit and has an amino acid sequence corresponding to SEQ ID NO:87.

58. (withdrawn) The expression system according to Claim 57, wherein said subunit has a nucleotide sequence corresponding to SEQ ID NO:86.

59. (withdrawn) The expression system according to Claim 52, wherein the protein corresponds to the β subunit and has an amino acid sequence corresponding to SEQ ID NO:107.

60. (withdrawn) The expression system according to Claim 59, wherein said subunit has a nucleotide sequence corresponding to SEQ ID NO:106.

61. (currently amended) A host cell transformed with a heterologous nucleic acid molecule according to Claim ~~44~~ 11.

62. (original) The host cell according to Claim 61, wherein the protein has an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:87, SEQ ID NO:95, and SEQ ID NO:107.

63. (original) The host cell according to Claim 61, wherein the nucleic acid molecule has a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:86, SEQ ID NO:94, and SEQ ID NO:106.

64-67 (canceled)

68. (currently amended) A method of preparing a recombinant vector comprising inserting a nucleic acid molecule taken from Claim ~~44~~ 11 into a vector.

69. (original) The method of Claim 68, wherein said vector is an expression vector.

70. (original) A recombinant vector made according to the method of Claim 68.

71. (currently amended) A method of making a recombinant host cell, comprising inserting the nucleic acid molecule of Claim ~~44~~ 11 into a host cell.

72. (original) The method of Claim 71, wherein said host cell is a bacterial cell, a yeast cell or an animal cell.

73 (canceled)

74. (new) The isolated polynucleotide according to Claim 7, wherein the tau subunit encoded by the polynucleotide has a molecular weight of about 58,000 daltons as determined by SDS-PAGE under non-reducing conditions.

75. (new) The isolated polynucleotide according to Claim 7, wherein the tau subunit encoded by the polynucleotide further comprises a four-cysteine residue zinc-finger domain.

76. (new) The isolated polynucleotide according to Claim 7, wherein the polynucleotide further comprises a hepta-A frameshifting site.

77. (new) The isolated polynucleotide according to Claim 76, wherein the polynucleotide further comprises a Shine-Dalgarno sequence upstream of the hepta-A frameshifting site.

78. (new) The isolated polynucleotide according to claim 7, wherein the tau subunit encoded by the polynucleotide is at least 80 percent identical to the amino acid sequence of SEQ ID NO: 2.

79. (new) The isolated polynucleotide according to claim 7, wherein the tau subunit encoded by the polynucleotide possesses ATPase activity at temperatures up to 65°C.

80. (new) The isolated polynucleotide according to claim 7, wherein the tau subunit encoded by the polynucleotide possesses ATPase activity at $[Na^+]$ above 0.2M.